

Serial No. 10/688,694
Amendment Under 37 CFR §111
Response to Office Action dated August 9, 2005

REMARKS/ARGUMENTS

Reconsideration of the objections and rejections set forth in the above-identified Office Action are respectfully requested.

The thoroughness of the review of this application by Examiner Daniels is appreciated. By this Amendment, it is believed that the objections and rejections set forth in the Office Action have been obviated.

By this Amendment, independent claims 1 and 14 have been amended to more particularly define the invention, as previously recited in claims 2 and 22, respectively. Claims 2 and 22 have been cancelled without prejudice. A minor change has been made to claim 23. In addition, new claim 28 has been added to recite that the process is an in-line process wherein the PCTFE film is oriented without being wound up after formation. Also, claim 29 has been added which is dependent on claim 28 and recites the preferred range of orientation, namely at a stretch ratio of between about 2:1 and 2.5:1. Support for this feature can be found, for example, at page 6, line 9 of the Specification.

Claims 13, 26 and 27, which were withdrawn from consideration due to the restriction requirement being made final, have been cancelled without prejudice to the filing of a divisional application thereon.

Claim 1 was objected to in the Office Action because of the presence of the word "it" after "while". This objection is well taken and the entire phrase has been deleted. In its place it has been stated that the film which is stretched has a crystallinity of from about 10% to about 45%. A similar change has been made in claim 14, and similar language appears in new claim 28. In addition, it was stated that the full name of the chemical compound (PCTFE) should be written out at least once in the claims. This suggestion has been followed, not only in claim 1 but also in originally presented claim

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14 and new independent claim 28. With these changes it is respectfully submitted that the stated objections should be withdrawn.

Prior to discussing the rejections of the claims set forth in the Office Action, it is believed that it would be helpful to briefly review the present invention.

The present invention relates to a method of making oriented films of polychlorotrifluoroethylene (PCTFE) polymers, both homopolymers and copolymers. These films have excellent transparency and moisture barrier properties. The films have been used in many demanding applications, including pharmaceutical blister packaging and in the manufacture of electroluminescent structures such as lamps.

Typically such films are manufactured by a film extrusion process, wherein molten PCTFE resin is cast into the form of a film, which is subsequently wound up. Stretching of such film is done as an off-line process.

Stretched films of PCTFE resins are known from U.S. Patent 4,544,721 to Levy. However, such patent requires that the film be substantially amorphous before it is stretched and that stretching be conducted within a narrow stretch zone. Such a process results in reduced line speeds and hence reduced manufacturing efficiencies.

It has been found that PCTFE polymer films can be oriented in their crystalline state to provide films with excellent water vapor barrier properties while maintaining their other desirable mechanical and chemical properties.

One advantage of the process of this invention is that the orientation is simpler and can be done in-line with the manufacture of the film. The resultant film has a very low water vapor transmission rate, which is less than about 20% of the water vapor transmission rate of comparable film which is unoriented.

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The method comprises, inter alia, orienting a PCTFE film which has a crystallinity prior to orientation in the range of about 10 to about 45%. More preferably, the crystallinity of the film prior to orientation is in the range of about 15 to about 35%.

It is respectfully submitted that claims 1, 3-12, 14-21 and 23-25, 28 and 29 are patentable and should be allowed.

The rejections of the claims as set forth in the Office Action are respectfully traversed.

Claims 1, 4-9, 11 and 12 were rejected under 35 USC 102 (b) as being anticipated by USP 5,833,070 (Mizuno), and claims 2, 3 and 10 were rejected under 35 USC 103 (a) as being obvious over Mizuno. Reconsideration and withdrawal of these rejections are respectfully requested.

It was stated in the Office Action that Mizuno teaches the various steps of claim 1, including cooling the PCTFE polymer to form a film that is crystalline. In this regard, reference was made to column 6, lines 1-5 of Mizuno, with the statement being made that the crystalline content is inherent in that the film is still crystalline after stretching (reference being made to column 4, lines 53-58).

Mizuno discloses a process for making PCTFE film which uses a sequence of a relatively low-temperature melt-extrusion and a low temperature stretching. The resulting film has a crystallinity of 15 to 75%.

Mizuno's process calls for the use of a resin which produces a melt flow rate within a specified range (see column 5, lines 48 – 62). The process also includes melt-extruding at a relatively low temperature (see column 3, lines 40-46). It is respectfully submitted that Mizuno is no more pertinent to Applicant's claimed invention than is the Levy patent which is discussed in the instant specification.

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It is submitted that the melt-extruded film of Mizuno, prior to extrusion, is an amorphous film like that of Levy, rather than a crystalline film as claimed herein. This is clear from column 6, lines 2-5 wherein it is stated that the resin is preferably cooled down to a temperature to suppress crystallization of the PCTFE stock sheet and facilitate stretching thereof. By suppressing crystallization, the film would be amorphous rather than crystalline.

As disclosed in the instant specification, the crystallinity of the films in the process of this invention, prior to orientation, is at least about 10%. The preferred crystallinity range of about 10 to about 45% has been inserted into the independent claims in order to more specifically recite the fact that the film, prior to stretching, is a crystalline film. This is in contradistinction to the film of Mizuno, as well as the film of Levy as discussed above.

It is respectfully submitted that nowhere does Mizuno teach that the crystallinity of the PCTFE film, prior to stretching, is from about 10-45%. Rather, the explicit teaching of Mizuno is that crystallization of the film should be suppressed, rather than enhanced; this is accomplished through the specific process steps and polymer material chosen by Mizuno.

Since Mizuno clearly does not teach that his PCTFE film, prior to orienting at a ratio of at least 1.5:1 while holding under tension (as claimed herein), has a crystallinity level within the amounts claimed in claim 1, it is respectfully submitted that Mizuno does not anticipate claim 1, or its dependent claims.

With respect to dependent claims 8 and 9, additionally it is not seen where Mizuno teaches the claimed maximum water vapor transmission rates.

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Concerning the rejection of claims 2 and 3 based on 35 USC 103 (a) as being obvious over Mizuno, it is respectfully submitted that there is no suggestion in Mizuno or any other applied reference to orient a PCTFE film which has a crystallinity level of from about 10 to about 45% or more specifically from about 15 to about 35%. The fact that the films of Mizuno have a crystallinity level of 15-50% after stretching does not in any way indicate or suggest that the film before stretching would have the amount of stretching as claimed. The orientation process increases the crystallinity of the film, so the end crystallinity level cannot be used to determine the crystallinity level of the film before stretching. It is respectfully submitted that one skilled in the art would not be led from the teachings of Mizuno to orient a crystalline film, as set forth in independent claim 1 (which incorporates the feature of previous dependent claim 2), or as set forth in dependent claim 3. Accordingly, it is respectfully submitted that Mizuno does not render claim 1 (as originally presented or as amended) to be obvious, or claim 3 either.

With regard to the obviousness rejection of claim 10 over Mizuno, it was acknowledged in the rejection that Mizuno does not disclose that the film has a water vapor transmission rate of at least less than about 20% of the rate of comparable film which is unoriented. It was just concluded in the rejection that it would have been obvious to expect a decrease in the water vapor transmission rate when comparing the films of Mizuno. However, it is submitted that there is no support for the conclusion to expect at least a 20% decrease in water vapor transmission rate; in this regard, Mizuno is silent as to the difference concerning comparable water vapor transmission rates and there is no other evidence that is being relied upon to establish the claimed range. Accordingly, it is respectfully submitted that claim 10 is not obvious from the disclosure of Mizuno.

Therefore, Applicant respectfully submits that the 35 USC 102 (b) and 35 USC 103 (a) rejections based on Mizuno are in error and should be withdrawn. The claims are submitted to be patentable over the teaching of Mizuno and should be allowed.

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Claims 14-25 were rejected under 35 USC 103 (a) as being obvious over Mizuno in view of DeAntonis (USP 4,677,017). This rejection is likewise submitted to be in error and should be withdrawn.

It was stated that Mizuno appears to be silent as to the casting roll claimed in step a) of independent claim 14, but that DeAntonis teaches casting onto a casting roll. However, it is submitted that even if the teachings of DeAntonis were added to those of Mizuno, the process of claim 14 would still not be shown since there is no suggestion in either reference of orienting a PCTFE film while it is in its crystalline state. There certainly is no suggestion in either patent that the crystallinity of the film prior to orientation be within the range of from about 10-45%, as set forth in amended claim 14. Accordingly, it is respectfully submitted that claim 14 defines in a patentable manner from the proposed combination of references.

With regard to dependent claim 23 which sets forth a more specific range of crystallinity before stretching, this claim is likewise submitted to be further removed from the proposed combination of references for the reasons stated above with respect to the 35 USC 103 (a) rejection of claim 3 over Mizuno alone. Neither of the two references teach or suggest orienting a PCTFE film that has a crystallinity level of from about 15 to about 35%, and therefore it is submitted that any combination of these references would not result in the invention claimed in claim 23.

It is also submitted that claims 15-21, 24 and 25 are patentable over the combination of Mizuno and DeAntonis, at least for the same reasons as explicated with respect to the rejection of claim 14.

Therefore, it is respectfully submitted that the 35 USC 103 (a) rejection of claims 14-21 and 23-25 based on the combination of Mizuno and DeAntonis should be withdrawn and these claims likewise allowed.

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Applicant further respectfully submits that new claims 28 and 29 are even further removed from the teachings of Mizuno alone or in combination with DeAntonis. Claim 28 is similar to amended claim 1, but further specifies that the stretching step is done in-line. This in-line process, starting with a crystalline PCTFE polymer, is not taught or suggested by the cited prior art. In addition, dependent claim 29 recites that the stretch ratio is between about 2:1 and 2.5:1. This is in distinction to the stretch ratios of 3 to 64 disclosed in Mizuno.

Applicant respectfully submits that claims 28 and 29 are further patentable over the references of record and should be allowable.

SUMMARY

In summary, it is respectfully submitted that claims 1, 3-12, 14-21, 23-25, 28 and 29 are patentable and should be allowed. It is therefore most respectfully requested that the rejections be reconsidered and withdrawn, and the application allowed. Early notification to that effect is most respectfully solicited.

Should the Examiner believe that a discussion with Applicant's representative would in any way be of assistance, he is respectfully requested to telephone the undersigned.

Respectfully submitted,
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